

Atmospheric Science 102 Syllabus

Introduction to Weather and Climate II

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I. Course Description

Atmospheric Science (ATMO 102) 3 credit hours. This course will explore the dynamic atmosphere including topics of air masses, weather forecasting, and an in-depth view into severe weather and hurricanes. Climatology will also be discussed and debated as it pertains to current trends of global warming. Prerequisites: none.

II. Course Objectives and Outcomes

This course will enable the student to:

- A. Identify and explain major concepts in meteorology and climatology and their subtopics.
- B. Discuss orally and explain in writing how weather affects our everyday lives.
- C. Explain the importance of weather on society and the business world.
- D. Utilize the process skills and problem solving skills to solve laboratory applications in meteorology.
- E. Explain and give examples of the relationship of science, technology, and society.

III. Course Topics

- F. Air masses and Fronts
- G. Middle-Latitude Cyclones
- H. Weather Forecasting
- I. Severe Weather – Thunderstorms and Tornadoes
- J. Tropical Weather – Hurricanes
- K. Climate and Climate Change

IV. Instructional Methods and Activities

This course will be made as interactive as possible. Daily weather briefings will begin each class period. Students will study current weather patterns and research historical weather patterns in order to determine their effects on climate. The concept of global warming will also be discussed and debated in class based upon student gathered evidence.

V. Evaluation and Grade Assignment

A. Methods

1. Written examinations (100 points each)
2. Quizzes (announced and unannounced)
3. Class work points: problem solving and laboratory activities, individual and/or group projects, and class participation (up to 150 points).

B. Written examinations and quizzes

1. Will cover specified chapters and activities
2. Will consist of all or some of the following types of test methods: matching, multiple choice, short answer, labeling, and discussion
3. One hour will be designated for taking 100 point tests, 30 minutes for quizzes

C. Class work points

1. Class work points will be awarded throughout the semester. Some may be random and without notice. Attendance and participation will be rewarded; therefore, notice may not be given for the days points can be earned.
2. Class work points are earned simply by participating in the process of inquiry during laboratory and classroom activities. There are no wrong answers during this process, therefore, enthusiasm and effort earns you points!

D. Grading Scale

90-100 A; 80-89 B; 70-79 C; 60-69 D; below 60 F

VI. Course Schedule (See attached)

Course schedule is to be used as a guide and is subject to change.

VII. Textbook

Ahrens, C. (2008). *Meteorology Today*, (9th edition). Connecticut: Thomson Publishers.

VIII. Provision Statement for the Physically Challenged

If a student is visually, physically, or otherwise challenged, the instructor is to be informed within the first week of class so that accommodations can be made. Situations that arise at anytime will be accommodated as they may occur.

IX. Provision Statement for the Learning Disabled

If a student is learning disabled, the instructor is to be informed within the first week of class so that accommodations can be made. Situations that arise at anytime will be accommodated as they may occur.

X. Discrimination Statement

This class is an open forum for your ideas and those of your classmates. However, language or behavior, which in any way degrades or discriminates against any group, including, but not limited to age, race religion, gender, and/or sexual orientation will not be tolerated in the classroom. The result of this type of behavior could be expulsion from the class and perhaps from the institution.

XI. Academic Misbehavior

Identified instances of academic misconduct, which include any form of cheating or plagiarism will not be tolerated. The result of these actions could include expulsion from the class or from the college.

XII. Class Policies – See Attached Sheet

Atmospheric Science 102 General Course Outline

***This schedule is for general guidance only. Prepare for a flexible schedule.**

Modifications WILL BE MADE during the course.

XI. Air Masses and Fronts

- A. Source Regions and Classifications
- B. North American Air Masses
- C. Fronts
 - 1. Stationary
 - 2. Cold
 - 3. Warm
 - 4. Occluded
 - 5. Upper Air
 - 6. Drylines

XII. Middle Latitude Cyclones

- A. Polar Front Theory
- B. Vertical Structure
- C. Cyclogenesis

XIII. Thunderstorms and Tornadoes

- A. Thunderstorms
 - 1. Air Mass
 - 2. Severe Thunderstorms and Supercells
 - 3. Squall Lines and Mesoscale Convective Complexes (MCC's)
 - 4. Dryline Thunderstorms
 - 5. Gust Fronts, Microbursts, and Derechos
 - 6. Lightning and Thunder
- B. Tornadoes
 - 1. Tornado Life Cycle
 - 2. The Fujita Scale
- C. Severe Weather and Doppler Radar

XIV. Hurricanes

- A. Tropical Weather
- B. Anatomy of a Hurricane
- C. Hurricane Formation and Dissipation
- D. North Atlantic Hurricanes

I. Circulation of the Atmosphere

- A. Local Winds
- B. Global Circulation
- C. The Jet Stream
- D. El Nino and Global Weather

II. Air Pollution

- A. Sources and Types of Air Pollution
- B. Meteorological Factors Affecting Air Pollution
- C. Acid Precipitation

III. Climatology

- A. The Climate System
- B. Natural Causes of Climate Change
- C. Human Impact on Climate Change
- D. Greenhouse Warming

E. Climate of Cities

IV. World Climates

- A. Climate Classification
- B. Climate Controls
- C. Tropical Climate
- D. Wet and Dry Climates
- E. Dry Climates
- F. Mid-Latitude Climates
- G. Humid Continental Climates
- H. Polar Climates